

What is claimed:

1. A method of promoting hair growth in a subject, comprising inducing or mimicking an effect of Wnt-promoted signal transduction in a subject, thereby promoting hair growth.

5 2. The method of claim 1, wherein Wnt-promoted signal transduction is induced or mimicked in a dermal papilla cell of the subject.

3. The method of claim 1, wherein an effect of Wnt promoted signal transduction is induced by administering to the subject an agent which increases the level of Wnt protein  
10 production or activity.

4. The method of claim 3, wherein the agent is a Wnt polypeptide or a functional fragment or analog thereof.

15 5. The method of claim 3, wherein the agent is a nucleotide sequence encoding a Wnt polypeptide or functional fragment or analog thereof.

6. The method of claim 5, wherein the Wnt polypeptide is Wnt3, Wnt 4, or Wnt 7.

20 7. The method of claim 1, wherein an effect of Wnt promoted signal transduction is mimicked by administering to the subject an agent that inhibits  $\beta$ -catenin phosphorylation or inhibits GSK3 $\beta$  kinase.

8. The method of claim 7, wherein the agent is lithium chloride.  
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9. The method of claim 1, wherein an effect of Wnt promoted signal transduction is mimicked by administering to the subject an agent that increases cytoplasmic accumulation of  $\beta$ -catenin.

30 10. The method of claim 1, wherein an effect of Wnt promoted signal transduction is mimicked by an agent that interacts with a Frizzled receptor.

11. The method of claim 10, wherein the agent is an antibody.

12. A method of inhibiting hair growth in a subject, comprising inhibiting the level of  
5 Wnt protein or inhibiting an effect of Wnt-promoted signal transduction, in a subject.

13. The method of claim 12, wherein the level of Wnt protein or Wnt-promoted signal transduction is inhibited in a dermal papilla cell.

10 14. The method of claim 12, wherein an effect of Wnt-promoted signal transduction is inhibited by administering to the subject an agent which decreases the level of Wnt protein production or activity.

15 15. The method of claim 12, wherein the Wnt protein is a Wnt3, Wnt 4, or Wnt 7.

16. The method of claim 12, wherein an effect of Wnt-promoted signal transduction is inhibited by an agent that increases  $\beta$ -catenin phosphorylation or induces GSK3 $\beta$  kinase activity.

20 17. The method of claim 12, wherein an effect of Wnt promoted signal transduction is inhibited by administering an agent that decreases cytoplasmic accumulation of  $\beta$ -catenin.

25 18. A method of evaluating whether a subject is at risk for hair loss, comprising detecting the presence or absence of a genetic lesion in a Wnt gene or misexpression of a Wnt gene, thereby evaluating whether a subject is at risk for hair loss.

19. The method of claim 18, wherein the Wnt gene Wnt3, Wnt 4, or Wnt 7.

30 20. The method of claim 18, wherein the genetic lesion or misexpression is detected in a hair follicle of the subject.

21. The method of claim 18, wherein underexpression of Wnt is indicative of a risk of hair loss.

22. A method of identifying a compound capable of promoting hair growth, comprising:

5           contacting a cell capable of expressing a Wnt polypeptide with a test compound; and

          determining the level of Wnt polypeptide or nucleic acid expression in the cell, wherein a compound capable of increasing Wnt polypeptide or nucleic acid expression is indicative of a compound capable of promoting hair growth,

10           thereby identifying a compound capable of promoting hair growth.

23. The method of claim 22, wherein the Wnt polypeptide is Wnt 3, Wnt 4, or Wnt 7.

24. The method of claim 22, wherein the test compound is a Wnt fragment or analog.

25. The method of claim 22, wherein the cell is a hair follicle cell.

26. A method of identifying a compound capable of inhibiting hair growth, comprising:

20           contacting a cell capable of expressing a Wnt polypeptide with a test compound; and

          determining the level of Wnt polypeptide or nucleic acid expression in the cell, wherein a compound capable of decreasing Wnt polypeptide or nucleic acid expression is indicative of a compound capable of inhibiting hair growth,

          thereby identifying a compound capable of inhibiting hair growth.

27. The method of claim 26, wherein the Wnt polypeptide is Wnt 3, Wnt 4, or Wnt 7.

28. The method of claim 26, wherein the test compound is a Wnt antagonist.

29. The method of claim 26, wherein the cell is a hair follicle cell.

30. A method of culturing a dermal papilla (DP) cell, comprising culturing the DP cell in the presence of an increased level of Wnt or an agent which mimics an effect of Wnt-promoted signal transduction.

5 31. The method of claim 30, wherein the agent is lithium chloride.

32. The method of claim 30, wherein a Wnt polypeptide or a functional fragment or analog thereof is added to the culture.

10 33. The method of claim 30, wherein the DP cell is cultured in the presence of a cell which expresses a Wnt polypeptide or a functional fragment or analog thereof.

34. A culture media for dermal papilla (DP) cells, comprising: a Wnt polypeptide or a functional fragment or analog thereof, or an agent which mimics an effect of Wnt promoted  
15 signal transduction.

35. The culture media of claim 34, wherein the agent is lithium chloride.

36. A method of promoting or maintaining anagen phase gene expression in a dermal  
20 papilla (DP) cell, comprising: increasing the level of Wnt protein or mimicking an effect of Wnt promoted signal transduction in the DP cell.

37. The method of claim 36, wherein the Wnt protein is Wnt3, Wnt 4, or Wnt 7.

25 38. The method of claim 37, wherein mimicking an effect of Wnt promoted signal transduction comprises inhibiting  $\beta$ -catenin phosphorylation in the DP cell.

39. The method of claim 38, wherein mimicking an effect of Wnt promoted signal transduction in the DP cell comprises contacting the cell with lithium chloride.

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40. A method of providing and maintaining a dermal papilla (DP) cell graft comprising:

providing a DP cell from a subject; and  
culturing the DP cell under conditions that induce or mimic an effect of Wnt-  
promoted signal transduction, thereby providing and maintaining a dermal papilla (DP) cell  
graft.

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41. The method of claim 40, wherein the dermal papilla cell is cultured in the presence of  
Wnt or a fragment or analog thereof.

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42. The method of claim 40, wherein the dermal papilla cell is cultured in the presence of  
lithium chloride.

43. The method of claim 40, wherein the dermal papilla cell is cultured in the presence of  
 $\beta$ -catenin and/or LEF-1.

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44. The method of claim 40, wherein the dermal papilla cell is cultured in the presence of  
an agent which inhibits  $\beta$ -catenin phosphorylation.

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45. The method of claim 40, wherein the dermal papilla cell is cultured in the presence  
of an agent which inhibits GSK3 $\beta$  kinase.

46. The method of claim 40, wherein the dermal papilla cell is cultured in the presence  
of an agent which promotes accumulation of  $\beta$ -catenin.

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47. The method of claim 40, further comprising the step of returning the DP cell to the  
same or a different subject.